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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/445,423	12/10/1999	KAZUO HATA	2839-0072-0	9913

22850 7590 07/27/2005

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ALEXANDRIA, VA 22314

EXAMINER

FERGUSON, LAWRENCE D

ART UNIT PAPER NUMBER

1774

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/445,423

Applicant(s)

HATA ET AL.

Examiner

Lawrence D. Ferguson

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 5-12 and 14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7 is/are allowed.
- 6) ☒ Claim(s) 5, 6 and 8-12 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

1. This action is in response to the amendment mailed July 12, 2005. Examiner regrets the untimely reopening of the case and withdraws the previous rejections to further prosecute the claimed invention. Claims 5-12 and 14 are pending in this case.

### ***Claim Rejections – 35 USC § 103(a)***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 5-6 and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hata et al. (U.S. 6,001,761).

Hata discloses a method for producing a ceramics sheet, where a calcined green sheet is interposed between porous green sheets, which are calcined and contain particles having an average particle diameter of 2 to 100um (column 4, lines 28-61) where the green and porous sheets are heated (baked) (column 4, lines 35-45). Hata further discloses the particle has a weight percent of 80 or more (column 7, lines 20-22) where the sheets average 0 cracks (defects) in Examples 1-9 in Table 1. Hata does not explicitly teach the particles being of a specific shape or configuration, however, it would

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have been obvious to one of ordinary skill in the art to make the particles spherical, since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art. Hata does not disclose the spherical ceramic particles having a ratio of major axis relative to a minor axis of 1 to 3. Because Hata has a ceramic green sheet with equivalent materials as the claimed invention, it would have been expected for the major and minor axis of the spherical ceramic particles to be the same as Applicant claims.

***Claim Rejections – 35 USC 102(e)***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 5-6 and 9-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Takeuchi et al. (U.S. 5,955,392).

Takeuchi discloses a method for making a calcined ceramic green sheet comprising ceramic particles having a spherical diameter of 0.01-0.5 $\mu$ m (column 2, lines 1-20; column 3, lines 34-40; column 8, lines 19-21 and Table 1) where the ceramic

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green sheet may be laminated with other green sheets (spacers) and fired (baked) simultaneously (column 6, lines 8-10) providing a green sheet sandwiched between two green sheets, which are calcined (column 8, lines 19-21). Takeuchi discloses it is possible for the surface of the ceramic sheet to have 1 defect on the surface (column 4, lines 3-10), which meets the claim limitation of having not more than 5 defects in an area of 900mm<sup>2</sup> from the first green sheet. The reference discloses the spherical ceramic particles are greater than eighty weight percent (column 7, lines 12-15).

***Claim Rejections – 35 USC § 103(a)***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. (U.S. 5,955,392).

Takeuchi is relied upon for claim 5 as above. Takeuchi does not disclose the spherical ceramic particles having a ratio of major axis relative to a minor axis of 1 to 3. Because Takeuchi has a ceramic green sheet with equivalent materials as the claimed invention, it would have been expected for the major and minor axis of the spherical ceramic particles to be the same as Applicant claims.

8. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The closest prior art does not teach or suggest the recited method for producing a ceramic sheet further including where the calcined sheet is obtained by calcining a second green sheet at a temperature that is 50 to 300 C lower than a sintering temperature of the second green sheet. The prior art does not teach motivation or suggestion for modification to make the invention as instantly claimed.

9. Claim 7 is allowed. The closest prior art does not teach or suggest the recited method for producing a ceramic sheet further including where each of the spacers has a sintering temperature 50 to 300 C higher than the sintering temperature of the first green sheet. The prior art does not teach motivation or suggestion for modification to make the invention as instantly claimed.

### ***Response to Arguments***

10. Applicant's arguments to 35 U.S.C. 102(e) as being anticipated by Hata et al. (U.S. 6,001,761) has been fully considered and the rejection has been withdrawn due to it not specifically disclosing spherical particles.

Applicant's arguments to 35 USC 103(a) being unpatentable over Hata et al. (U.S. 6,001,761) has been considered but is unpersuasive. Applicant argues Hata is silent about the

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shape of the particles in the porous sheet and fails to suggest spherical ceramic particles. It would have been obvious to one of ordinary skill in the art to make the particles spherical, since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art.


### **Conclusion**

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence Ferguson whose telephone number is 571-272-1522. The examiner can normally be reached on Monday through Friday 9:00 AM – 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye, can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Lawrence Ferguson  
Patent Examiner  
AU 1774

  
RENA DYE  
SUPERVISORY PATENT EXAMINER  
A.U. 1774 7/25/08